Problem Wk.2.1.1: State machines

Consider a state machine with:

- inputs: 0, 1, 2
- states: 0, 1, 2, 3
- outputs: 0, 1, 2, 3
- initial state: 0
- transition function:

	Input		
	0	**1**	**2**
old state: 0	1	3	0
old state: 1	2	0	0
old state: 2	3	1	0
old state: 3	0	2	0

- output function: same as transition function

It may be helpful for you to draw a state diagram of this machine, to visualize its operation.

1. What is the best description of this machine:
   - None
   - it counts forward and backward mod 4, and has a reset input
   - it counts how many more 1's than 0's have been input, and has a reset input

2. If you feed this string of inputs into the machine, what would the string of outputs be? Enter the output produced by the indicated input in the sequence below.
   - input 0, output: ____
   - input 0, output: ____
   - input 2, output: ____
   - input 0, output: ____
   - input 0, output: ____
   - input 0, output: ____
   - input 1, output: ____
   - input 1, output: ____
   - input 1, output: ____

3. What string of inputs could you feed in, in order to get this string of outputs? Enter the input that would produce the indicated output in the sequence below.
   - input: ____ output 3
   - input: ____ output 2
   - input: ____ output 0
   - input: ____ output 1
   - input: ____ output 2
   - input: ____ output 3

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